

## **REMARKS**

This paper outlines the claims with preliminary amendment, and also distinguishes the currently amended claims from the previously cited references, responding to the final office action dated November 09<sup>th</sup>, 2009 and comments in advisory action sent on January 19<sup>th</sup>, 2010.

Claims 1, 2, 4-10, 15, 17, 19 and 42 remain pending in this application. In view of the following remarks, Applicant requests further examination and reconsideration of the present patent application.

### **Claim Amendments**

Independent claim 1 is hereby amended to introduce a clause – “said system is configured to output both hydrogen and electricity.” This is just to clearly bring out that the system produces at least two net streams – one comprising hydrogen and other comprising electricity.

The hydrogen rich stream is clearly shown as stream 28 in Fig. 1 – 6. The electricity produced is also shown to be supplied to grid 86 in the same figures.

Thus the claim amendments do not add any new matter.

### **Rejections under 35 USC 102 / 103**

Applicant respectfully traverses the rejection of claims 1, 2, 4-9, 13, 15, 16 and 19 under 35 USC §102(b), as being anticipated by or in the alternative under 35 USC §103(a) as being obvious over Hansen et al. (U.S. Patent No. 5,380,600 Hansen, hereinafter “Hansen”).

First, currently amended claim 1 recites *inter alia* – “said system is configured to output both hydrogen and electricity”.

Hansen does not output both hydrogen and electricity. Hansen shows a closed loop system that produces (only) electricity using the Molten Carbonate Fuel cell. See claim 1. As clearly seen from Fig. 1, hydrogen separated from the anode exhaust in

hydrogen recovery unit 18 is recycled to anode supply line 40 via line 90. (Hansen, column 3, lines 34-38). Thus the hydrogen production in Hansen is purely for internal consumption and the only output from Hansen is electricity. Thus Hansen lacks this feature of the present invention.

Further, Claim 1 recites *inter alia*, "said system configured to flexibly control production of hydrogen and electricity on demand"

As clearly brought out in Fig. 1 and multiple places in the current specification such as page 7, lines 18 – 21, the separation unit is configured to produce a hydrogen rich stream 28. The Gas turbine 46 and Fuel cell assembly 18 produce electrical energy. Thus the system produces both hydrogen and electrical energy. Moreover, as clearly brought out in page 18, lines 10 – 16, "The co-production systems in accordance with the various embodiments discussed above have the flexibility to control the production of hydrogen from the anode exhaust stream and generation of electricity depending on the demand. For higher demand of exported hydrogen, the fuel cell assembly is operated on low utilization mode wherein the anode exhaust stream comprises higher amount of unutilized hydrogen, which may be recovered for export using the separation unit downstream of the fuel cell assembly."

Since Hansen is configured to produce only electricity as discussed earlier,—there is no teaching / suggestion / motivation of having a flexibility to flexibly control production and output both hydrogen and electricity on demand. Hansen clearly lacks in this feature and hence cannot anticipate current invention as recited by claim 1.

Therefore, Applicant respectfully submits that Hansen, does not disclose every element of independent claim 1 and does not anticipate it under 35 USC 102(b). Claims 2, 4-10, 13-17, 19 and 42 depend directly or indirectly from claim 1. Applicant respectfully requests that the Examiner withdraw the rejection under 35 USC 102 / 103.

### Rejections under 35 USC §103

The Examiner has rejected claims 1, 2, 3-10, 15, 17, 19 and 42 under 35 USC §103(a) as being unpatentable over over Farooque (U.S. Patent No. 5,084,362, hereinafter "Farooque") in view of Nakamura et al. (U.S. Patent No. 7,052,790, hereinafter "Nakamura") as evidenced by Baker (U.S. Patent No. 3,522,101, hereinafter "Baker"). The Examiner has further rejected claims 13, 14 and 16 under 35 USC §103(a) as being unpatentable over Farooque and Nakamura as applied to claims 1 and 15 and in further view of Sridhar et al. (U.S. Publication No. 2004/0202914, hereinafter "Sridhar").

First, claim 1 recites, *inter alia*, "said system is configured to output both hydrogen and electricity" and "system configured to flexibly control production of hydrogen and electricity on demand."

Thus, to anticipate or render the claims obvious, the system recited in the reference has to (produce) output both hydrogen and electrical energy and have a flexibility of operation to produce either based on demand (emphasis added).

Farooque, as shown in FIG. 1, recites a closed loop system - the hydrogen production in Farooque is only for internal consumption and (produces) outputs only electrical energy. Thus it lacks features of outputting both hydrogen and electricity.

Nakamura describes a fuel cell system, wherein hydrogen-side exhaust gas is introduced into the combustion section 42 of the reformer and burned with the city gas, thus, hydrogen though produced in the system is consumed within and only electricity is output from the system as a whole.

Baker describes a system combining thermally regenerable battery and fuel cell. However, it does not describe production of hydrogen. It recites production of electricity and work (using heat engine).

Combination of Farooque with any of the secondary references – Nakamura or Baker does not overcome the deficiency that Farooque does not output both hydrogen and electricity. Hence, Applicant respectfully requests the Examiner to withdraw said rejection of claims 1, 2, 3-10, 15, 17, 19 and 42 under 35 USC §103(a) as being

unpatentable over Farooque in view of Nakamura as evidenced by Baker.

Claims 13, 14 and 16 have been cancelled; hence the rejections towards those are moot.

At least for these reasons among others, Applicant submits that the combination of these references does not teach, suggest or disclose the invention as recited in claim 1 and hence any of the claims dependent directly or indirectly on claim 1. Applicant respectfully requests that the Examiner withdraw the rejection under 35 USC 103.

### **Summary**

For the reasons set out above, Applicant respectfully submits that the application is in condition for allowance. Favorable reconsideration and allowance of the application are, therefore, respectfully requested.

If the Examiner believes that anything further is necessary to place the application in better condition for allowance, the Examiner is kindly asked to contact Applicant's undersigned representative at the telephone number below.

Respectfully submitted,

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